(1) Home Base Offices that only had one FTE and had to close on scheduled days to staff the Mobile Office. (2) Home Base Offices with more than one FTE assigned that did not have to close on scheduled days to open a Mobile DLO at another location.

DLS Employee Hours

As mentioned in the Data Validation and Data Preparation section, only transactions initiated at a DLO after the DLS rollout had time stamp data that could be used for transaction processing time calculations. Employee Hours for each DLO were prorated to reflect total employee hours since the DLS rollout at each DLO and were used to calculate Field Processing Time by Operational and Employee Hour.

CALCULATING DLO AND FTE USAGE FACTORS

The Field Usage Dataset was used to calculate initiated transaction volume. Initiated transaction volumes were used to calculate DLO and FTE Usage Factors. Both Factors were calculated statewide, by region, site code, office size, and office type.

DLO Usage Factor
= 2010 initiated transaction volumes ÷ 2010 Operational Hrs

FTE Usage Factor
= 2010 initiated transaction volumes ÷ 2010 Employee Hrs

CALCULATING DLO AND FTE PROCESSING FACTORS

The Field Processing Time Dataset was used to calculate field transaction processing time by subtracting the transaction start time stamp from the end time stamp. Field Processing times were averaged statewide, by region, site code, office size, and office type.

DLO Processing Factor
= 2010 transaction processing time ÷ 2010 DLS Operational Hrs

FTE Processing Factor
= (2010 transaction processing time ÷ 2010 DLS Employee Hrs) x 100

The FTE Processing Factor was the only Factor that was transformed into a percent by multiplying by 100. This was done because the FTE Processing Factor is best understood and usable as a percent. For example, a value of 0.16 would mean that 16% of an FTE's time was spent processing transactions.

PHASE TWO: CUSTOMER DEMAND

MAPPING DRIVER LICENSE OFFICES AND CUSTOMER ZIP CODES

A total of 306 DLOs were geocoded, assigned latitude and longitude coordinates, for mapping and analysis purposes. 238 DLOs were geocoded automatically using the ArcGIS geocoding tool, 17 DLOs were

geocoded using the Pick Address from Map tool, and 51 DLOs were manually geocoded through the identification of geographic coordinates using aerial imagery.

DLS transaction data included customer ZIP codes. The ZIP codes reflected the customer's mailing address. There are two types of ZIP codes: ZIP codes corresponding to a geographic area and ZIP codes corresponding to a geographic point (such as a post office containing P.O. boxes). All point ZIP codes were reassigned to the area ZIP codes that contained them. These point ZIP codes were reassigned to better represent the geographic areas customers drove from to complete a transaction at a DLO. The population-weighted centroid of each area ZIP code was calculated using ArcGIS. A population-weighted centroid is the center of a set of features where the population of each feature pulls the centroid toward the areas with the highest population. The population-weighted centroid is placed at the location of the shortest average distance from all populations in the area. Census block groups were used to find the population weighted centroids of ZIP codes. A census block group is a geographic unit used by the U.S. Census Bureau to report demographic data (U.S. Census Bureau 2011). A census block group is the smallest geographic unit with demographic data broken down by age. DLS transaction data were combined with the population-weighted centroids.

MODELING STATEWIDE POTENTIAL DEMAND

To visualize the spatial distribution of potential customer demand, Business Analyst extension was used to model geographically optimal office locations. Each Optimal Office Location Model used one of three populations to place offices. The populations used were 2010 Weighted Population, 2015 Weighted Population (projected), and 2010 Employee Population (where Texans work). These populations are referred to as the Analysis Populations throughout this report. The Analysis Populations represented customer demand and considered where people lived, where they are predicted to be living in 2015, and where they worked. The 2015 population was important because decisions must be made that look towards the future. The employee population was important because some customers who visited DLOs likely visited the DLO closest to their work instead of the location closest to their home. The 2010 and 2015 weighted populations were created using data obtained from Business Analyst. The 2010 employee population was also obtained from Business Analyst data package and showed where Texans worked. Each population was associated with a census block group.

The 2010 and 2015 populations were weighted by the propensity of customers to initiate a transaction at a DLO in 2010 (ini-

tiated transaction rates), and the likelihood for customers to initiate a transaction more than once in the same year (repeat initiated transaction rates). Initiated transaction rates and repeat initiated transaction rates were calculated by Region and by five-year age groups (e.g. 15- to 19-year-olds) to account for geographic and demographic variation.

Initiated transaction rates were calculated for each DLD Region by dividing the volume of initiated transactions for a given age group at a DLO in 2010 by the respective age group's 2010 population. Initiated transaction volumes included only the first transaction that was initiated by each customer in 2010. The regional initiated transaction rate for each age group was applied to every census block group within that region. For example, 25- to 29-year-olds with a regional initiated transaction rate of 20% applied to a block group with a 25- to 29-year-old population of 100 resulted in a weighted population of 20 for that age group. Figure 2 shows the variation between Regions 2A and 4 to highlight the importance of calculating initiated transaction rates by Region and age group.

Repeat initiated transaction rates were calculated for each DLD Region and each age group by dividing the volume of initiated transactions for customers who had already initiated a transaction at an earlier time (including 2nd, 3rd, 4th transactions, etc.) by

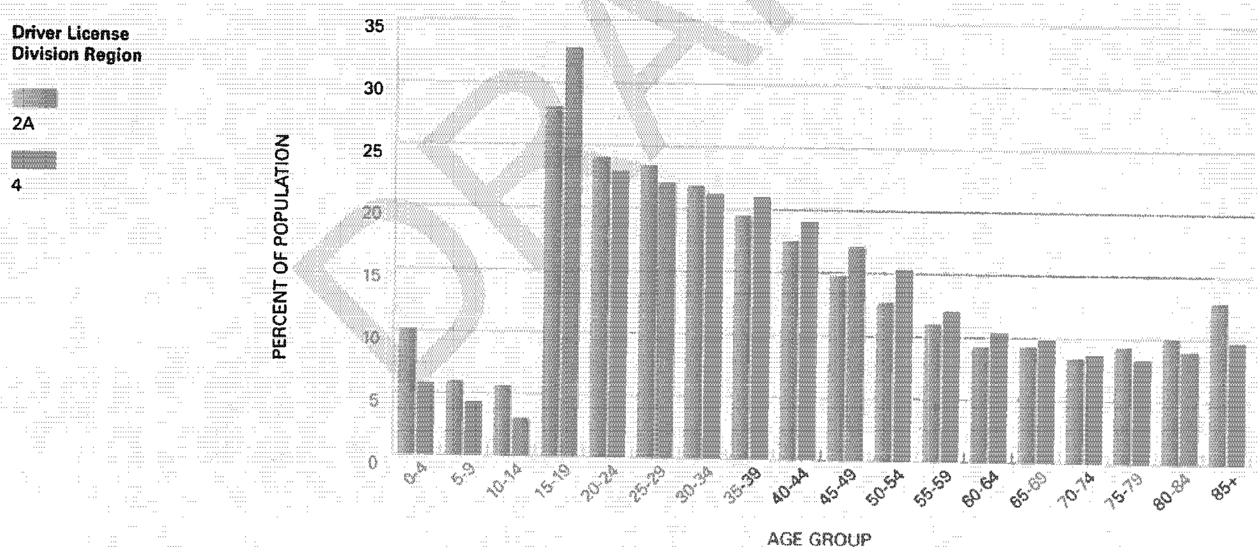

Figure 2. Initiated transaction rates for five year age groups for Driver License Division Regions 2A and 4. The variation between the two regions highlights the importance of weighting population by DL Region and age group.

the volume of initiated transactions calculated above. For example, if the same age group in the census block group described above had a 50% repeat initiated transaction rate, the weighted population would be increased from 20 to 30. Figure 3 shows the variation of repeat initiated transaction rates for Regions 2A and 4. The 2010 employee population was not weighted because it was not available in five-year age groups.

There were two primary assumptions when populations were weighted. It was assumed that regional initiated transaction and repeat initiated transaction rates calculated for 2010 will remain constant. Further, it was assumed that regional initiated transaction and repeat initiated transaction rates for each region could be equally applied within that particular region.

The 2010 weighted population, 2015 weighted population, and the 2010 employee population Optimal Office Location models each placed 226 statewide optimal office locations (the existing number of DLOs at the time of analysis). The placement of these optimal office locations was a function of the density and distribution of the Analysis population being used. The optimal office location model used a spatial clustering algorithm. The spatial clustering algorithm was a mathematical operation that found geographic centroids of population

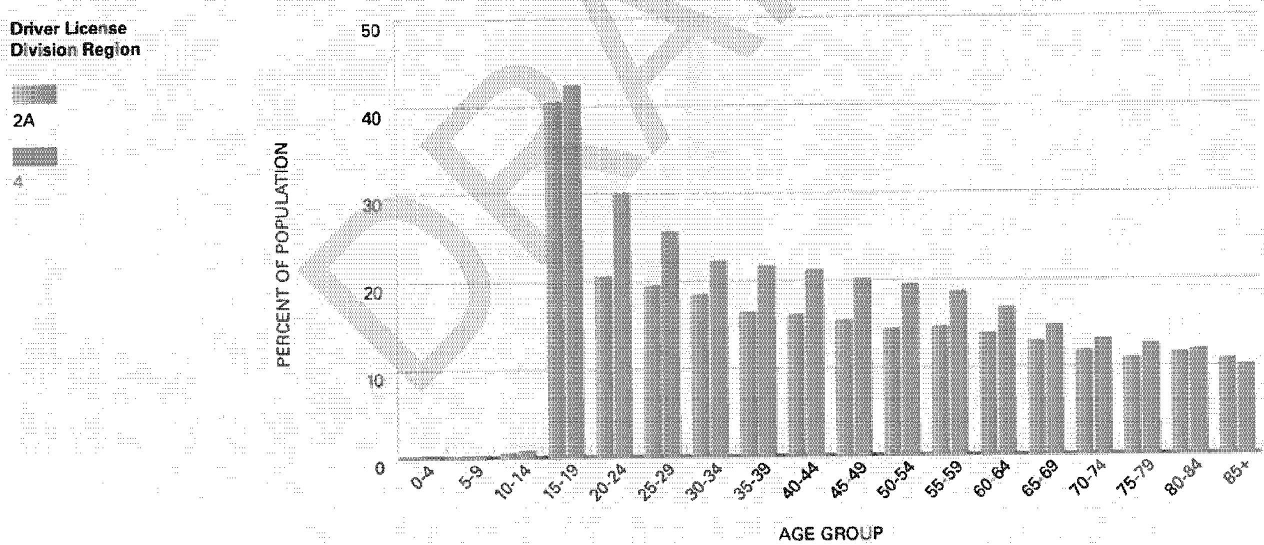

Figure 3. Repeat initiated transaction rates for five year age groups for Driver License Division Regions 2A and 4. The variation between the two regions highlights the importance of weighting population by DL Region and age group.

density and distribution and placed offices as near to these centroids as possible (Figure 4) while accounting for the placement of other optimal office locations. Population densities and distributions were represented by points at the population weighted centroids of census block groups. The spatial clustering algorithm operated randomly by design. Therefore, each simulation placed optimal office locations in a different geographic order. Each modeled optimal office location affected and was affected by every other modeled optimal office location; the greater the number of offices and larger the geographic area being modeled, the greater the variation between simulations. Modeling 226 optimal office locations across the state of Texas introduced variation. To address the variation, 100 model simulations were run using each of the three populations (300 total simulations). The number of modeled offices placed in each DLD Region was

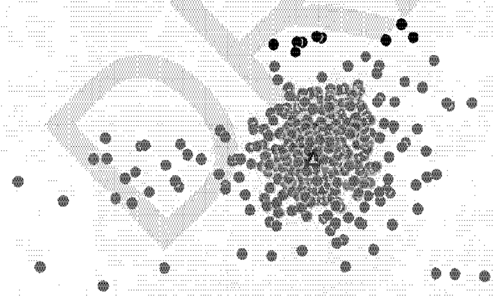

Figure 4. The Optimal Office Location Model used a spatial clustering algorithm. The gray triangle is the optimal office location calculated using the population represented by the red dots.

summed for each simulation. For each population's 100 simulations, the average number of modeled offices placed in each DLD Region was calculated. The deviation of each model from the average was calculated. The model simulation for each population that least deviated from the average was chosen as the "best fit" model. This resulted in three optimal office location models, one for each population used. All three models were used in further analyses.

REGIONAL FTE REALLOCATION

All three Analysis Populations were individually summed for each DLD Region. To equitably reallocate FTEs, percent of statewide customer population was calculated for each DLD Region by dividing the summed Regional Analysis Populations by the three respective Statewide Analysis Populations. The percent of statewide customer population for each DLD Region was multiplied by 1011 (the existing number of statewide FTEs) to determine the equitable number of FTEs a DLD Region should be allocated. For example, if one of the Analysis Populations within a DLD Region was 1,000,000 which equaled 15% of the state's Analysis Population, the DLD Region would be model-reallocated 15% of the state's FTEs. With a statewide pool of 1011 FTEs, this DLD Region would be model-reallocated 151.7 FTEs.

Regional FTE Reallocation calculations were compared to regionally summed Optimal Office Location Model results.

OPTIMAL OFFICE LOCATION CONFLUENCES

Optimal office location "best fit" models for each Analysis Population placed 226 office locations for a total of 678 (226 offices x 3 models) modeled office locations. To interpret and simplify the modeled optimal office locations, areas where modeled offices came together, or had a confluence, were identified. Three types of confluences were identified (Table 3). The confluences were identified within the radius of a circle. All confluences in urban areas had a radius of five miles or less and all confluences in rural areas had a radius of 15 miles or less.

The first two confluence types identified modeled optimal office locations near existing DLOs. The first type, Three-Model Confluence, identified instances where one 2010 Weighted, one 2015 Weighted, and one 2010 Employee Population Modeled Optimal Office Location was placed near an existing office. The second type, Two-Model Confluence, identified instances where one 2015 Weighted, and one 2010 Weighted or 2010 Employee Population Modeled Optimal Office Location was placed near an existing office. The inclusion of a 2015 Weighted Modeled Optimal Office Location in the Two-Model Confluence was important because this population is most useful in guiding recommendations for the future. The Three-Model Confluence and Two-Model Confluence types identified existing DLOs serving the population demand indicated by the modeled optimal office locations. The

Table 3. Optimal Office Location Confluence type descriptions.

Confluence Type	Description	Radius: Urban	Radius: Rural
Three Model Confluence	• One **2010** Weighted Population Model • One **2015** Weighted Population Model • One 2010 **Employee** Population Model • Near an existing Driver License Office	**<5 miles**	**<12 miles**
Two Model Confluence	• One **2015** Weighted Population Model • One **2010** Weighted Population Model **OR** One 2010 **Employee** Population Model • Near an existing Driver License Office		
Three Model Confluence without an existing Driver License Office	• One **2010** Weighted Population Model • One **2015** Weighted Population Model • One 2010 **Employee** Population Model		

third type of confluence, Three-Model Confluence without an Existing DLO, identified the same three types of population modeled optimal office locations as the Three-Model Confluence but in areas without an existing DLO. To further simplify the Three-Model Confluences without an Existing DLO, a single point was placed in the center of each confluence. These points symbolized customers that were potentially not served by existing offices. These points were called Statewide Points of Demand (Figure 5).

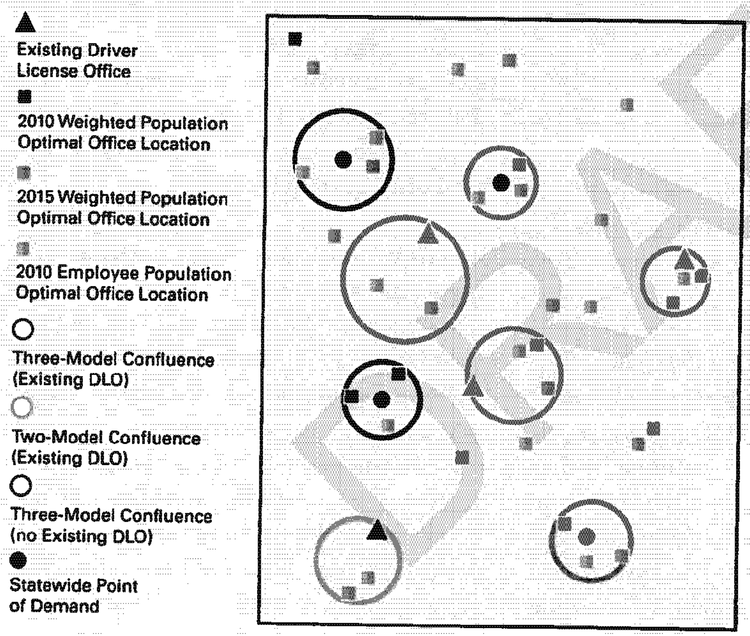

Figure 5. Three types of Modeled Optimal Office Location Confluences were identified. Statewide points of demand were placed in the center of Three-Model Confluences without an Existing DLO and symbolized customers that were potentially not served by existing DLOs.

PHASE THREE: DRIVER LICENSE OFFICE RECOMMENDATIONS

THE FTE MODEL

A series of analyses were combined to create a model for determining equitable FTE allocations for DLOs. The FTE Model consisted of three primary steps: creation of DLO service areas, assignment of customer population to DLO service areas, and FTE allocation for DLOs using the assigned customer population.

Business Analyst was used to create Thiessen Polygons, or service areas, for DLOs. Thiessen Polygons are polygons created using the distance between analysis points. The boundary lines of each Thiessen Polygon are equidistant between analysis points. In other words, every location within a Thiessen Polygon is closer to its assigned analysis point than any other analysis point.

As discussed in the Modeling Potential Statewide Demand for DLD Services section, the Analysis Populations were associated with census block group population weighted centroids. All centroids were assigned to the Thiessen Polygon that contained them and the Analysis Populations associated with each centroid were summed. The summed Analysis Populations for each Thiessen Polygon were assigned to its corresponding DLO (Figure 6).

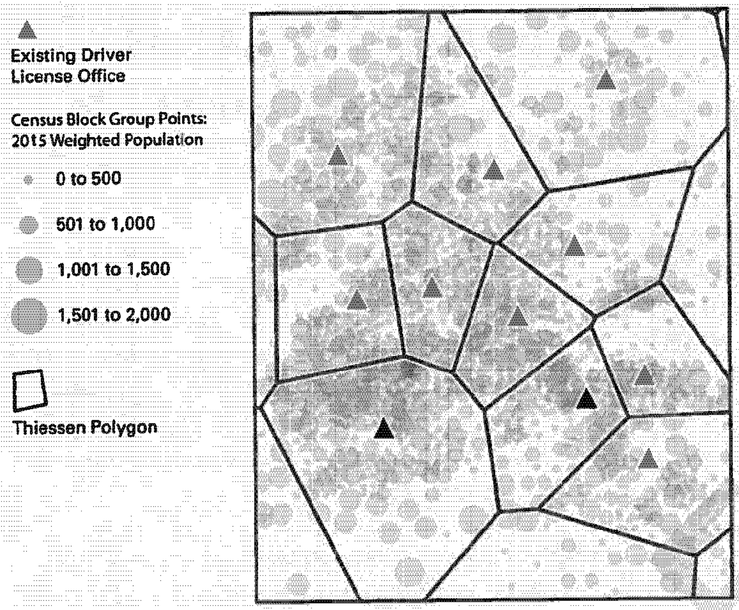

Figure 6. Customer Population was assigned to Thiessen Polygons (service areas) that were created for DLOs to calculate equitable FTE reallocations.

To calculate equitable FTE allocation, percent of statewide customer population was calculated for each DLO by dividing the three statewide Analysis Populations by the corresponding Analysis Populations assigned to each DLO. The percent of statewide customer population for each DLO was multiplied by 1248 (existing number of statewide FTEs + 250 additional statewide FTEs) to determine the equitable number of FTEs a DLO should be allocated. For example, if the customer population for the 2015 weighted population within a DLO Thiessen Polygon was 150,000 which equaled 2.5% of the state's weighted population, the DLO would be assigned 2.5% of the state's FTEs. With a statewide pool of 1248 FTEs, this DLO would be allocated 31.2 FTEs.

When using the FTE Model for analyses, some DLOs were omitted. These DLOs included Fort Hood, Fort Bliss, Austin-Denson, and Austin-Capitol because they serve specific populations such as military personnel. The Dallas-Downtown office was also removed because it is a walk-up office with six FTEs and cannot be expanded. Since Dallas-Downtown is located in the center of a dense urban core, the model would have reallocated more FTEs than could physically fit in the office. These omitted DLOs had a total of 13 existing FTEs.

The FTE Model had several constraints. (1) Service areas (Thiessen Polygons) assumed that customers will visit the DLO closest to their residence. (2) The Analysis Populations were weighted using only one year of transaction data (CY 2010). If transaction data from CY 2010 did not reflect long term DLD customer trends, population weighting may not be an ideal representation of DLD customers. (3) The potential impact on customer behavior that a new Mega DLO will have was unknown (e.g. will customers be more or less likely to visit a new Mega DLO?). (4) Additional lease cost, economic, social, and political considerations were not able to be used as parameters to constrain the model.

MEGA DRIVER LICENSE OFFICE ANALYSIS

All Mega DLO location and staffing analyses and recommendations strived to fulfill the improvements outlined in the *What Will It Take to Fix Driver License?* report. TxDPS DLD proposed the opening of six Mega DLOs in the *What Will It Take to Fix Driver License?* report and the addition of 250 FTEs to reduce wait times at existing DLOs. Mega DLOs are defined as offices with 25 or more FTEs.

The six potential Mega DLOs were proposed in what will be referred to as Mega Urban Areas. The Mega Urban Areas were Austin, San Antonio, DFW, and Houston. Modeled Optimal Office Location results, initiated transaction volumes, and FTE reallocations were compared to evaluate customer demand in the Mega Urban Areas and their respective DLD Regions. These measures were used to determine the most equitable distribution of the six Mega DLOs across the four Mega Urban Areas.

To begin Mega DLO analysis, study areas were established for the Mega Urban Areas. Next, Mega Urban Area Points of Demand were established using the results of the Optimal Office Location Model.

Multiple FTE Model simulations were completed to (1) find potential Mega DLO locations based on weighted populations and (2) equitably distribute FTEs to potential Mega DLOs and existing DLOs. The results of model-reallocated FTE distributions were modified into FTE Assignments to meet the needs of TxDPS as outlined in the *What Will It Take to Fix Driver License?* report.

MEGA URBAN STUDY AREAS

Initial study areas were established for the Mega Urban Areas and, based on feedback from DLD regional managers, were adjusted to reflect the knowledge each manager had of their DLD Region. Mega Urban Study Areas included both the Mega Urban Areas and surrounding suburban locations.

MEGA URBAN AREA POINTS OF DEMAND

Points of Demand were established for the Austin, San Antonio, DFW, and Houston Mega Urban Study Areas. Modeled FTE reallocations were summed to find the maximum number of Mega DLOs that could be staffed within each of the Mega Urban Study Areas if they were a clean-slate and no existing DLOs were present. For example, if a Mega Urban Study Area was reallocated 50 FTEs using the 2010 Weighted Population, and all existing DLOs were ignored, the FTEs in the Mega Urban Study Area could staff two Mega DLOs.

Using the maximum number of Mega DLOs within each of the four Mega Urban Study

Areas, five Optimal Office Location Model simulations were completed for each of the three Analysis Populations in each Mega Urban Study Area (15 total for each study area). Confluences of the Modeled Optimal Office Locations were identified for each Mega Urban Study Area. The confluences were simplified into Mega Urban Area Points of Demand, similar to Statewide Points of Demand.

After the Mega Urban Area Points of Demand were determined, the locations of existing DLOs were considered because no existing DLOs could be considered for closure in the Mega Urban Study Areas at the time of analysis, at the request of TxDPS. Mega Urban Area Points of Demand located near an existing DLO were not considered as potential Mega DLO locations. The only Statewide or Mega Urban Area Points of Demand that were considered were points that occurred in areas where there was customer demand and no existing DLO.

POTENTIAL MEGA DLO MODEL SIMULATIONS

Multiple combinations of existing DLOs, Statewide Points of Demand, and Mega Urban Area Points of Demand were created. Thiessen Polygons were created for each combination of existing DLOs, Statewide Points of Demand, and Urban Area Points of Demand. Population within a given Thiessen Polygon was summed and was used to calculate equitable FTE reallocations.

FTE Reallocation

FTEs were reallocated for all Thiessen Polygon simulations using 1248 FTEs. The number 1248 was determined from the formula:

1011 (existing statewide FTEs) - 13 (FTEs from omitted DLOs) + 250 (additional statewide FTEs)

Statewide and/or Urban Area Points of Demand were either eliminated, retained, or slightly adjusted based on how FTE reallocation stabilized or destabilized existing DLOs. The terms stabilized and destabilized describe the difference between the existing number of FTES and the reallocated number of FTEs at a DLO. A stabilized DLO was a DLO that was model-reallocated exactly or close to their number of existing FTEs. The simulations were conducted multiple times to find the solution that best stabilized FTE allocations at existing DLOs and created Mega DLOs that would positively impact the greatest number of customers. For example, a Statewide Point of Demand north of Austin was combined with the existing DLOs in the area, Thiessen Polygons were created, and FTEs were model-reallocated. After the results were documented and compared, this Statewide Point of Demand was removed and a Mega Urban Area Point of Demand was added. This process was repeated in all Mega Urban Areas until multiple potential Mega DLO locations were determined for the Austin, San Antonio, DFW, and Houston Mega Urban Study Areas.

POTENTIAL MEGA DLO LOCATIONS

Final potential Mega DLO locations were recommended for Austin (one Mega DLO) and Houston (two Mega DLOs). However, two potential Mega DLO location scenarios were presented to TxDPS for both San Antonio and DFW. The scenarios for San Antonio and DFW were presented with maps and model-reallocated FTEs for TxDPS to select the scenarios that best met their needs. The scenarios chosen for San Antonio and DFW by TxDPS are presented in the Results and Discussion section.

SEARCH AREAS

Certain realities were unable to be included in the model, such as available lease space and the potential unfeasibility of the exact recommended potential Mega DLO locations because of data limitations. Therefore, a search area with a three-mile radius was provided for each Mega DLO location recommendation within a five-mile buffer. The centers of the five-mile buffers are the ideal locations for the Mega DLOs. The three-mile search area was not always centered on the ideal location. Instead, it directed the search for potential Mega DLO locations toward areas of high customer demand.

RECOMMENDED FTE ASSIGNMENTS

After final Mega DLO locations were identified, FTE Assignment recommendations were determined. FTE Assignments considered model-reallocated FTEs, DLO FTE carrying capacities (number of FTEs that could be physically accommodated in a DLO), existing FTE allocations, and to meet the needs of TxDPS. FTE Assignment recommendations included the 250 additional statewide FTEs.

FTE DISPARITY

A hierarchy of FTE Disparity was determined for each existing DLO and potential Mega DLO. Each DLO's FTE disparity was calculated using the following formula:

FTE Disparity
= (Existing FTEs) - (Model-Reallocated FTEs)

An FTE Disparity less than zero indicated that a DLO's number of model-reallocated FTEs was greater than their existing number of FTEs. This indicated FTE Need in that DLO. For example, if an office had eight existing FTEs, but was model-reallocated 10 FTEs, the FTE Disparity for that office would be -2.0. In other words, the office needed 2 FTEs to be equitably allocated FTEs based on the population of potential customers in its service area. Offices with a disparity of zero FTEs were considered equitably allocated. This means that their reallocated FTE number was the same as their current FTE number. An FTE Disparity greater than zero indicated that a DLO's number of model-reallocated FTEs was less than their existing FTE allocation. This indicated FTE Surplus.

EXISTING FTES

To minimize disruption to the DLD and its employees, FTE Assignments began with the initial assumption that no existing DLO could lose FTEs. Therefore, every DLO began the FTE Assignment process with their existing number of FTEs and ended the process with no fewer than their existing number of FTEs.

POTENTIAL MEGA DLO FTE ASSIGNMENT

Initially, each potential Mega DLO had an existing FTE allocation of zero. Each potential Mega DLO was model-reallocated FTEs. By definition, a Mega DLO is allocated 25 or more FTEs. Considering the request of establishing six Mega DLOs and the definition of a Mega DLO, each of the six potential Mega DLOs was assigned 25 FTEs (150 total) to begin the FTE Assignment process. With 150 FTEs assigned to the six Mega DLOs, 100 FTEs remained to be assigned to other DLOs.

FTE ABSORPTION

No existing DLOs could be physically expanded due to economic and structural constraints. However, some DLOs could absorb additional FTEs. The number of FTEs that a DLO could absorb was FTE Absorption. Existing FTEs and Carrying Capacities were used to calculate FTE Absorption. Carrying Capacity, the total number of FTEs that a DLO could physically accommodate, was provided by regional managers for every DLO. The FTE absorption number for each DLO was determined using the following formula:

FTE Absorption
= (Carrying Capacity) – (Existing FTEs)

DLOs with a positive FTE Absorption number could be assigned more FTEs. DLOs with an FTE Absorption number of zero were at capacity and could not be assigned any more FTEs. No DLOs had a negative FTE Absorption number because Carrying Capacity was never less than the number of existing FTEs.

FTE ASSIGNMENT

FTEs were assigned to DLOs in a stepwise manner based on FTE Need and FTE Absorption. DLOs with the greatest FTE need took precedence over DLOs with a lower need. For example, if Office A had an FTE need of -10 (under allocated 10 FTEs) and Office B had an FTE need of -5, Office A would receive 5 FTEs from the remaining 100 available FTEs before Office B would receive an FTE. As high need DLOs with FTE absorptions greater than zero received FTEs, they were iteratively moved down the list and the DLO next on the list gained an FTE. At most, only one FTE was assigned to a DLO at a time to ensure the most equitable

distribution of FTEs to all DLOs. However, at this stage DLOs often received a portion of an FTE instead of a whole FTE. A portion of an FTE would be a part-time employee.

If an office was at the top of the FTE Need list but was unable to absorb any FTEs due to limited absorption capacity, FTEs were assigned to a nearby DLO, whenever possible. All nearby DLOs that received FTEs were within 20 miles of the DLO that could not absorb FTEs. If the nearby DLO was over allocated as a result of starting the FTE Assignment process with its existing number of FTEs (despite being model-reallocated fewer FTEs), the FTE(s) was subtracted from the FTE over allocation instead of an FTE being assigned the DLO. For example, if Office A was over allocated by three FTEs and was absorbing one FTE from an office that was unable to absorb FTEs (Office B), the new over allocation for Office A was two. The number of Assigned FTEs in Office A only surpassed the number of existing FTEs after the over allocation of three FTEs was accounted for. In other words, since both offices are near each other, the under allocation of Office B is balanced by the over allocation at Office A. This same process was applied when the DLO that could absorb FTEs was a potential Mega DLO. If a potential Mega DLO was model-reallocated less than 25 FTEs, the number of Assigned FTEs only surpassed 25 after the over allocation was accounted for by FTEs from nearby DLOs. For example, if a Mega DLO was model-reallocated 20 FTEs and absorbed two FTEs from a nearby existing DLO, those two FTEs were subtracted from the over allocation of five FTEs (that resulted from the Assignment of 25 FTEs at the beginning of the process) for a new over allocation of three FTEs. If a DLO with an FTE Need could not absorb any more FTEs and there were no existing DLOs or Mega DLOs nearby that could absorb them, that DLO was removed from the need list and identified as unable to have its FTE needs accommodated.

The process of assigning FTEs was repeated until all 100 FTEs were assigned to DLOs.

PHASE FOUR: POTENTIAL DRIVER LICENSE OFFICE CLOSURES

Potential DLO closures were identified that could be implemented in the future to make more resources available to DLOs with greater customer demand. These potential closures were selected using five criteria. The criteria were designed to isolate DLO whose closures would minimize disruption to customers. Each criterion was applied to every DLO and when a criterion was fulfilled the office was given a score of one. If a criterion was not met, the DLO was given a score of zero. The scores were totaled (with a maximum score of five) and used as a guide for potential closures. A higher score supported keeping an office open.

The five criteria were:

1. Drive time to the next closest DLO. Average customer drive time for every DLO was calculated using ZIP code population weighted centroids. The longest average customer drive time for any one DLO was 52 minutes. The drive time between DLOs was calculated and any DLO with a drive time greater than 52 minutes to the next closest DLO was given a score of one for this criterion.

2. Greater than 1,000 initiated transactions in 2010. 1,000 initiated transactions is less than four initiated transactions per weekday. Any DLO with an initiated transaction volume greater than 1,000 was given a score of one for this criterion.

3. County population (total persons residing within a county) greater than 10,000. In a few cases, a county with a DLO is surrounded by counties without DLOs. In these cases, the population of the surrounding counties was included in the population count. Any DLO in a county with a population greater than 10,000 was given a score of one for this criterion.

4. County population growth from 2000-2020 greater than 10,000. Population growth was an indication of increasing demand. Any DLO in a county with population growth from 2000-2020 greater than 10,000 was given a score of one for this criterion. Note: population growth between 2010 and 2020 is a projection (Texas State Data Center 2011).

5. The presence of a Modeled Optimal Office Location Confluence. Modeled Optimal Office Location Confluences indicated potential demand. Any DLO in a Two or Three-Model Confluence was given a score of one for this criterion.

A DLO that met four or more criteria would not be recommended as a potential closure. A DLO that did not meet any of the five criteria would be recommended for potential closure. DLOs with scores ranging from one to three were examined on a case-by-case basis as a potential closure. Potential office closures were divided into two groups: Tier 1 and Tier 2 closures. Based on the five criteria, Tier 1 potential closures would cause less disruption to customers, if closed, than Tier 2 potential closures.

In some cases, where the criteria did not provide enough information to make a potential closure recommendation, a Spider Diagram Analysis was used to assess where customers were traveling from to use DLO services. The Spider Diagram tool in Business Analyst used DLS ZIP code data (described in the Mapping Driver License and Customer ZIP Codes subsection) to draw lines between

customers and the DLO where a transaction was initiated. The lines represented the spatial distribution of customers and distances traveled to DLOs. The lines were symbolized to represent the volume of customers coming from each location. A thicker line indicated a larger volume of customers traveling from a ZIP code to a DLO. Analysis was limited to transactions with valid Texas ZIP codes. The lines were used to understand customer demand at rural offices in the context of office closures. Sometimes the criteria were not enough to make a recommendation for an office closure, particularly when two or more offices near each other met similar criteria. Using Spider Diagrams to visualize customer visitation patterns provided the information needed to make a recommendation that would have a negative impact on the least amount of people.

PHASE FIVE: ADDITIONAL ANALYSES

Several supplemental analyses, not directly connected to office recommendations, were performed on the 2010 transaction data. Supplemental analyses were performed for multiple reasons including special requests from TxDPS and additional tasks outlined in the Scope of Work.

TRANSACTIONS INITIATED BY 15- TO 19-YEAR-OLDS

TxDPS requested an analysis of transaction volume by office for 15- to 19-year-olds. The goal was to determine if the addition of Saturday hours would be beneficial in addressing the high volumes of initiated transactions by 15- to 19-year-olds. SPSS was used to determine the monthly percentage of initiated transactions by 15- to 19-year-olds out of all statewide initiated transactions.

LATE-DAY CLOSURES

TxDPS requested an analysis of transaction volumes at offices with late-day closures. For this analysis, an office with a late-day closure is defined as closing at 7:00pm. No office has a late-day closure more than two days per week. The request was made in response to anecdotal evidence from office managers that the volume of customers entering offices decreases from the five o'clock hour (5:00 pm-6:00 pm) to the six o'clock hour (6:00 pm-7:00 pm), suggesting a lack of demand during the six o'clock hour.

A unique dataset was created from the Field Processing Time Dataset. The dataset included only transactions completed on the days with a late-day closure in offices with late-day closures. For example, an office that closed late on Tuesday had only completed transactions from Tuesdays included in the dataset. The total number of transactions completed for all offices on late-day closure days was summed for every hour of the day from 7:00 am to 9:00 pm. The Field Processing Time Dataset contained a field that uniquely identifies the employee that processed an initiated transaction. Organizing the employees

by office and hour made it possible to know how many different employees were processing initiated transactions at a given time. The average number of employees that processed initiated transactions was calculated for every hour from 7:00 am to 9:00 pm. Of the completed transactions on late-day closures, the percent of completed transactions and the percent of average number of employees were calculated every hour from 7:00 am to 9:00 pm. The transaction and employee percentages were compared between the five o'clock hour and the six o'clock hour to evaluate the assertion by office managers that customer demand decreased during the last hour of the day on late-day closure days.

INTERNET TRANSACTIONS AND CONNECTIVITY

Internet transactions included all initiated transactions with Request Method TOL WEB. Internet transaction volumes were calculated by county. The transaction volumes were used to calculate the percentage of total statewide Internet transactions completed per county and the percentage of Internet transactions completed per county as a percentage of all initiated transactions with any Request Method. Three variables were used to describe Internet connectivity: number of people who had Internet access, number of people who used Internet daily, and number of people who made a purchase online within thirty days of data collection. Internet connectivity data by county were obtained from Business Analyst data package. A correlation analysis was completed to explore the relationship between Internet transaction volumes and connectivity.

TRANSACTIONS FOR TEMPORARY VISITORS

All initiated transactions for Temporary Visitors had Country of Origin data associated with them. The volume of initiated transactions for Temporary Visitors was determined by country using SPSS.

DRIVER EDUCATION

There are currently four types of driver education that can fulfill education requirements for a customer seeking an Original DL: parent taught driver education, commercial driver education, out-of-state equivalent driver education, and high school driver education. The Scope of Work called for analysis of driver education in correlation with transaction time and test failures. SPSS was used to run frequencies and descriptive statistics for driver education types prior to exploring relationships between transaction times and test failures. The results of the volume analysis, detailed in the Results and Discussion section, restricted additional analyses.

VISION, KNOWLEDGE, AND ROAD TESTS

Three types of tests are administered at DLOs: vision, knowledge (written), and road. The DLS Dataset contains information regarding the number of tests passed and/or

failed. Before the average number of tests passed/failed by transaction type were calculated, the test data were examined for any inconsistencies. The results of this examination restricted additional analysis and are detailed in the Results and Discussion section.

MODEL AND RISK EMPLOYEES

Model and risk employees were determined using three performance measures: total number of completed transactions; transaction processing time for each transaction type; and cumulative time to complete statewide initiated transaction volume. Each performance measure identified 10 model and 10 risk employees. A model employee ranked at the top of a performance measure and a risk employee ranked at the bottom. A total of 1,015 employees were included in the model and risk employee analyses.

MODEL AND RISK EMPLOYEES BY TOTAL NUMBER OF TRANSACTIONS COMPLETED

Each employee's total number of completed transactions was summed for the seven transaction types in the Field Usage Dataset. The employees with the most completed transactions were identified as the model employees and the employees with the fewest were identified as the risk employees.

MODEL AND RISK EMPLOYEES BY TRANSACTION PROCESSING TIME FOR EACH TRANSACTION TYPE

Average completed transaction processing times were calculated for all employees using the Field Processing Time Dataset in SPSS. The employees with the shortest and longest average processing times were identified for each of the seven transaction types. Model employees had the shortest processing times and risk employees had the longest.

MODEL AND RISK EMPLOYEES BY RANK OF CUMULATIVE TIME TO COMPLETE STATEWIDE TRANSACTIONS

The statewide initiated transaction volume for all transaction types was found. Each employee's average transaction time for each transaction type was multiplied by the statewide initiated transaction volume for each transaction type. The results were summed for each employee to find the total amount of time it would take each employee to complete all statewide initiated transactions. The employees that would complete the transactions in the shortest amount of time were identified as the model employees and the employees that would take the longest amount of time were identified as the risk employees.

3 Results & Discussion

The analyses completed on the 2010 DLS data included: workload snapshots, customer demand, Driver License Office recommendations (including potential Mega DLOs), potential Driver License Office closures, and additional analysis. The results and discussion of these analyses are detailed in this section.

PHASE ONE: DATA AND STATISTICS

WORKLOAD SNAPSHOTS

Workload snapshots (statistics to understand transaction volume) were completed statewide and regionally.

STATEWIDE

A total of 5,816,158 statewide transactions were included in the DLS transaction data for CY 2010 (excluding Request Method Other). Request Method volume revealed that 4,736,009 (82%) transactions were initiated in DLOs (Figure 7). Of the transactions initiated in DLOs, 93.5% had transaction status Complete (not Cancelled or In Progress) (Figure 8), 2.8% had a Correction No Fee descriptor, 1.9% were transactions for Temporary Visitors, and 4.7% were transactions for Out-of-State Transfers.

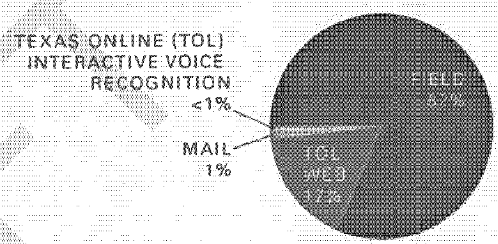

Figure 7. Driver License Division transaction request method rates.

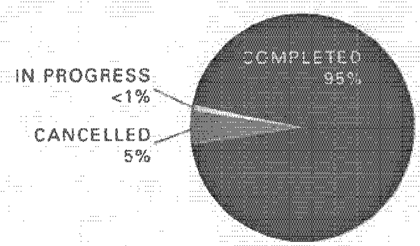

Figure 8. Driver License Division transaction status rates.

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Of the seven transaction types in the DLS data, initiated transaction type rates in DLOs, as a percentage of all transaction types, ranged from 2% for Renew ID transactions to 37% for Renew DL transactions (Figure 9).

Initiated transaction volume varied by month, day of week, and hour of day.

Monthly, initiated transaction volume peaked in August (Figure 10). The August peak was likely connected to students fulfilling DL and ID requirements before the start of the school year. Renew DL and Duplicate DL transactions were initiated more than any other transaction type across all months (Figure 11).

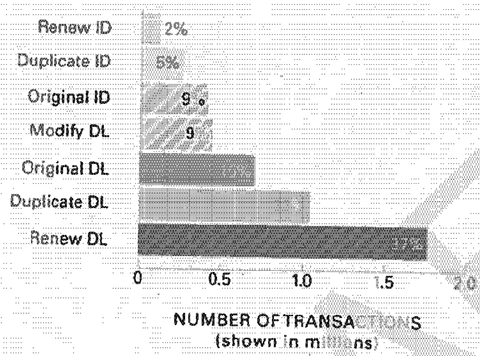

Figure 9. Number and percent of initiated transactions by transaction type.

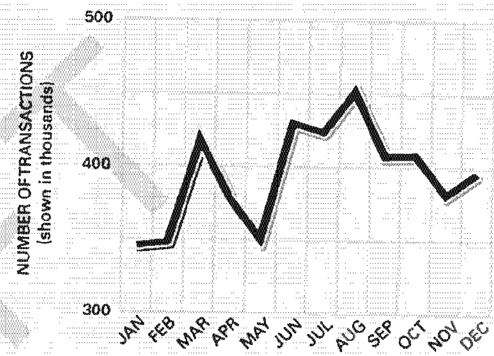

Figure 10. Number of initiated transactions by month of year for CY 2010.

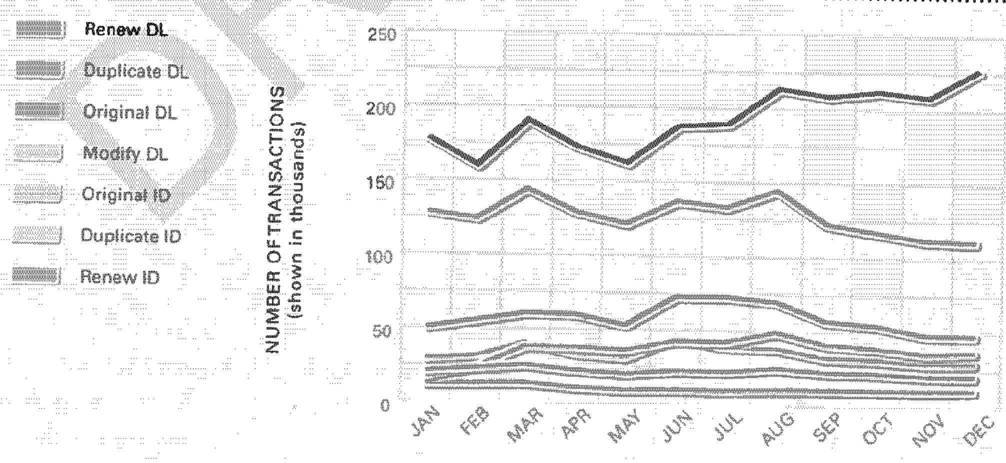

Figure 11. Number of initiated transactions by region by transaction type for CY 2010.

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The largest volume of initiated transactions occurred on Tuesdays and the smallest volume occurred on Thursdays (Figure 12). The number of DLOs open and the number of DLOs with late-day hours were explored as possible contributing factors. However, neither the peak on Tuesday nor the dip on Thursday could be explained by these variables. During the average workday, initiated transactions in the morning peaked during the 10 o'clock hour with a decrease in the 12 o'clock hour. In the afternoon, initiated transaction volume increased hourly from the 12 o'clock hour to the workday peak in the 4 o'clock hour (Figure 13). It is important to note that the decrease in initiated transactions during the 12 o'clock hour may not have been an indication of a decrease in customer demand, but rather a decrease in the number of employees processing transactions during that hour.

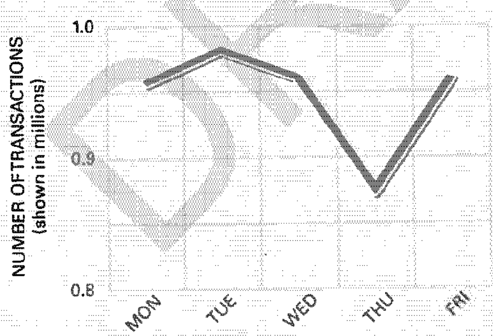

Figure 12. Initiated transaction volume by day of week.

Initiated transactions for Temporary Visitors, as a percentage of total initiated transactions, peaked in September (Figure 14). The September peak is likely related to the influx of international university students for the fall semester requiring DLs and IDs.

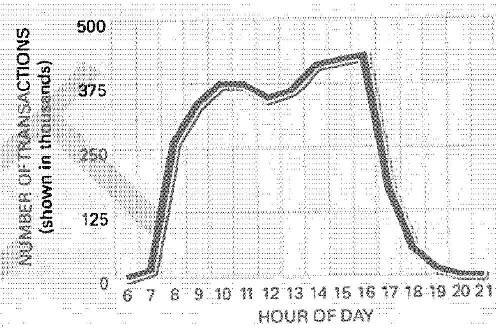

Figure 13. Initiated transaction volume by hour of day.

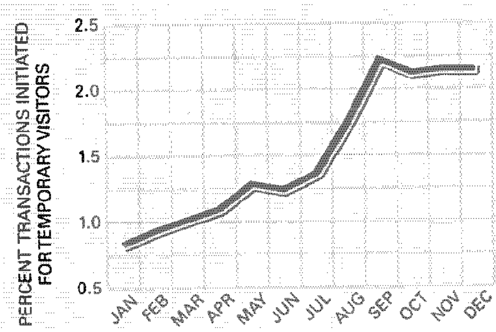

Figure 14. Initiated transactions for Temporary Visitors as a percentage of initiated transactions by month.

Of the seven transaction types in the DLS data, transaction processing times ranged from an average of 00:03:01 minutes for Duplicate DL transactions to an average of 00:23:31 minutes for Modify DL transactions (Table 4).

REGIONAL

Of the 4,736,009 initiated transactions in DLOs, Region 1B had the most initiated transactions with 16.5% of the state total and Region 5 had the least initiated transactions with 5.8% of the state total (Figure 15).

Region 1B had the highest volume of initiated transactions with transaction status Cancelled and Region 2A had the highest volume of initiated transactions with transaction status In Progress (Figure 16). As a percentage of total initiated transactions by region, Region 6A had the highest rate of initiated transactions with transaction status Complete at 94.8% and Region 4 had the lowest at 91.7% (Figure 17). Region 1B had the highest volume of transactions with a Correction No Fee descriptor (Figure 18). Region 1B also had the highest percentage of transactions with a Correction No Fee descriptor as a percentage of the Region's initiated transactions at 3.1% and Region 4 had the lowest at 2.5% (Figure 19). Region 2A had the highest volume of initiated transactions for Temporary Visitors (Figure 20). Region 2A also had the highest percentage of initiated transactions for Temporary Visitors as a percentage of the Region's initiated transactions at 4.2% and Region 6A had the lowest at 0.9% (Figure 21). Region 1B had the highest volume of initiated transactions for Out-of-State Transfers (Figure 22). Region 6B had the highest percentage of initiated transactions for Out-of-State Transfers with 7.3% and Region 3 had the lowest with 2.9% (Figure 23).

Table 4. Average processing time for completed transactions in CY 2010

Transaction Type	Average Processing Time
Renew ID	00:03:24
Duplicate ID	00:03:02
Original ID	00:04:29
Modify DL	00:23:31
Original DL	00:17:28
Duplicate DL	00:03:01
Renew DL	00:04:18

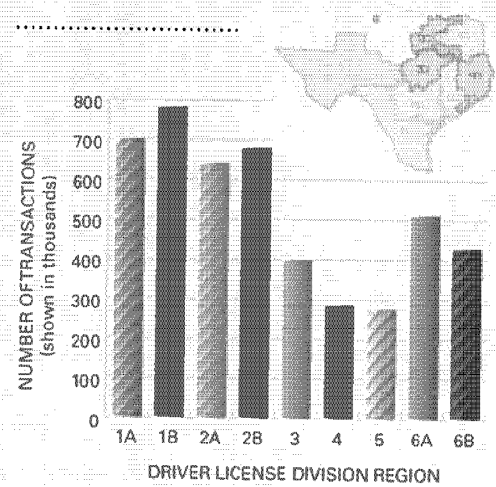

Figure 15. Volume of initiated transactions by Driver License Region.

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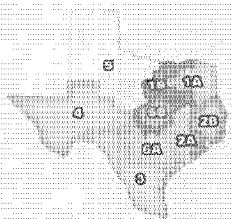


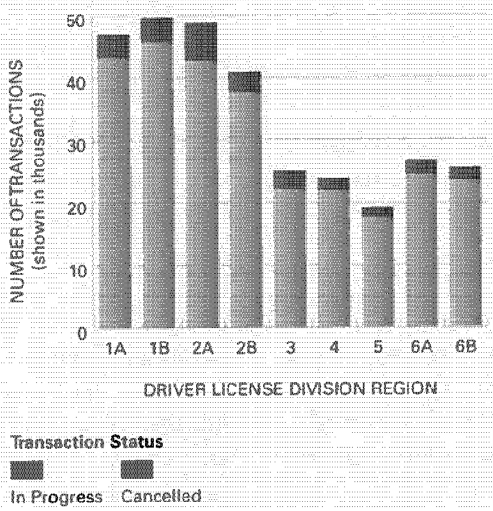


Figure 16. Transaction status (In Progress or Cancelled) volumes by region for initiated transactions.

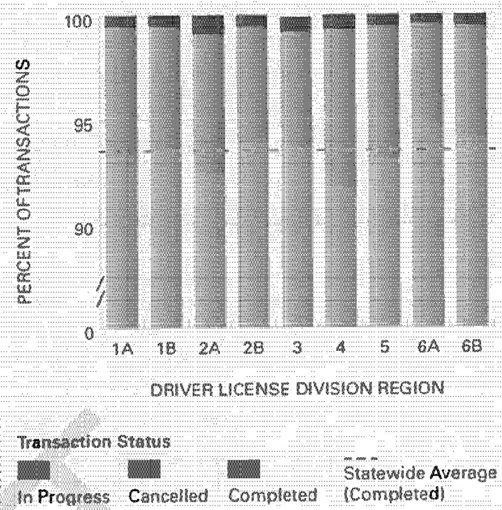


Figure 17. Transaction status for initiated transactions as a percentage of initiated transactions by region.

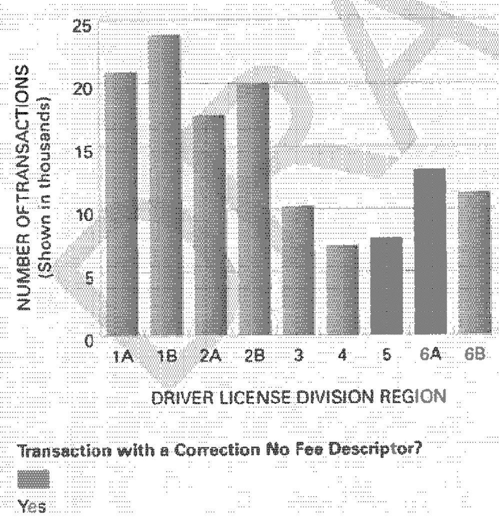


Figure 18. Volume of initiated transactions with a Correction No Fee descriptor by region.

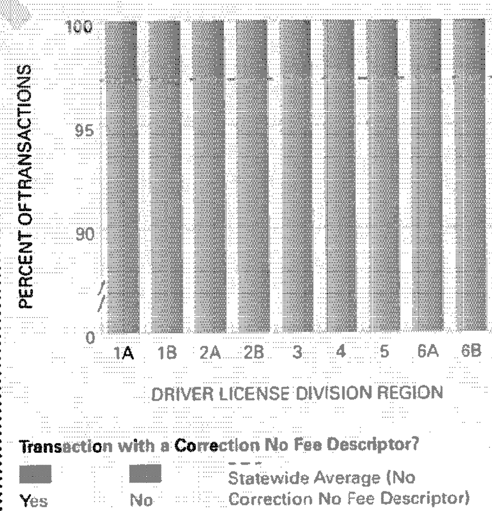
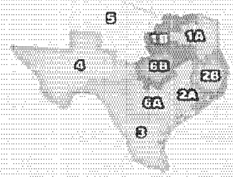


Figure 19. Initiated transactions with a Correction No Fee descriptor as a percentage of initiated transactions by region.



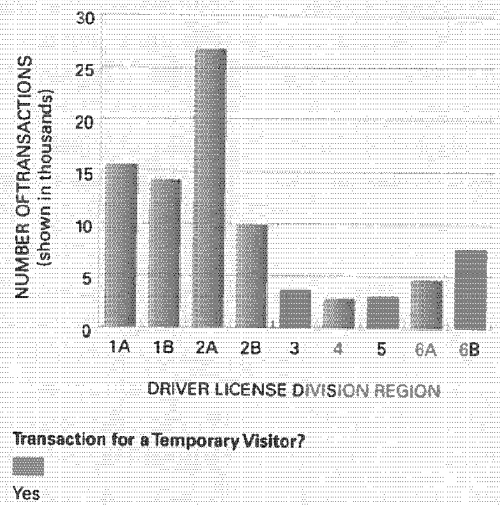


Figure 20. Volume of initiated transactions for Temporary Visitors by region.

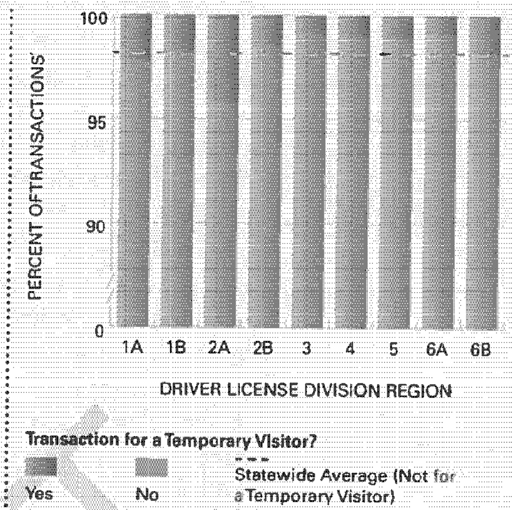


Figure 21. Initiated transactions for Temporary Visitors as a percentage of initiated transactions by region.

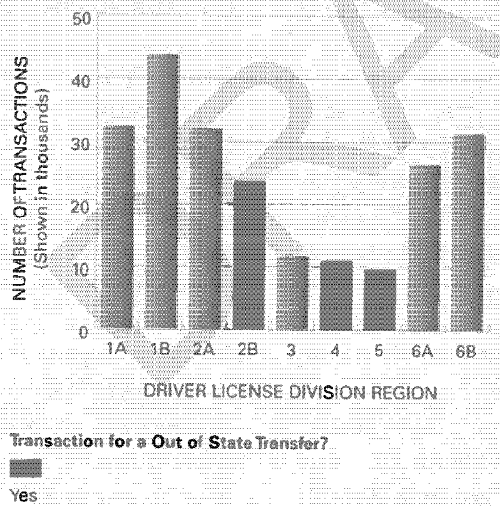


Figure 22. Volume of initiated transactions for Out of State Transfers by region.

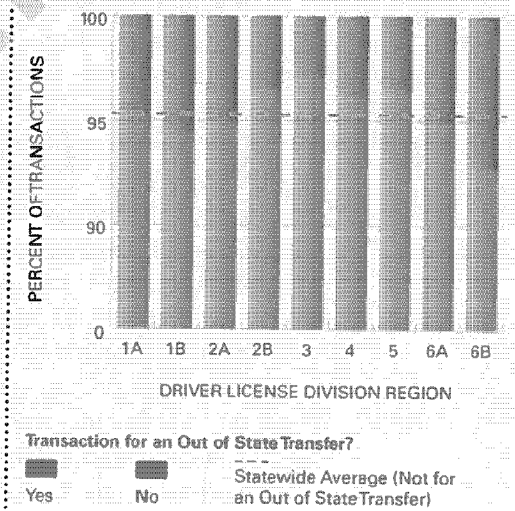


Figure 23. Initiated transactions for Out of State Transfers as a percentage of initiated transactions by region.

Of the seven transaction types in the DLS data, Renew DL was the most frequent initiated transaction type and Renew ID was the least frequent initiated transaction type in all regions (Figure 24 and Figure 25). This Regional trend follows the statewide results.

Regionally, initiated transaction volumes varied by month, day of week, and hour of day. In all regions, initiated transaction volume peaked in August (Figure 26 and Figure 27). Daily, initiated transaction rates were similar to the statewide rate with low volumes of initiated transactions on Thursday. Region 6A had a spike in initiated transactions on Wednesdays (Figure 28 and Figure 29). Approximately 64% of transactions in Region 6A were initiated in San Antonio and every DLO in San Antonio had a late-day closure on Wednesday. This is a possible explanation for the peak in initiated transaction on Wednesdays in Region 6A.

Average transaction processing time was calculated for each of the seven transaction types by region. Duplicate DL average processing times ranged from 00:02:54 minutes in Region 2B to 00:03:08 minutes in Region 6B. Duplicate ID average processing times ranged from 00:02:52 minutes in Region 6A to 00:03:11 minutes in Region 6B. Modify DL average processing times ranged from 00:14:40 minutes in Region 2A to 00:27:23 minutes in Region 1B. Original DL average processing times ranged from 00:14:01 minutes in Region 2A to 00:23:22 minutes in Region 4. Original ID average processing times ranged from 00:04:18 minutes in Region 2B to 00:04:57 minutes in Region 5. Renew DL average processing times ranged from 00:03:48 minutes in Region 2B to 00:05:04 minutes in Region 5. Renew ID average processing times ranged from 00:03:14 minutes in Region 6A to 00:03:38 minutes in Region 5 (Table 5). Duplicate DL, Duplicate ID, Original ID, and Renew ID average transaction processing times varied among regions by less than 40 seconds. These small variations in average processing time suggested that implementing additional training to improve processing time for these transactions types would have minimal impact on DLD resources and customer wait times. However, the larger variation for Modify DL, Original DL, and Renew DL transactions indicates the transaction types that should be the focus of improvement measures for regions with higher processing times. Decreases in average transaction processing times would directly affect customer wait times.

USAGE AND PROCESSING FACTORS

DLO/FTE Usage and Processing Factors were calculated statewide, by region, site code, office size, and office type. Statewide, the DLO Usage Factor (average number of transactions completed per Operational Hour) was 10.9. The FTE Usage Factor (average number of transactions completed per Employee Hour) was 2.3. The DLO Processing Factor (average number of hours spent processing transactions during an Operational Hour) was 1.1 for the state. The statewide DLO Processing Factor was greater than one hour because most DLOs had more than one FTE processing transactions per hour. Statewide, the FTE Processing Factor was 22% (Table 6). DLO/FTE Usage and Processing Factors for the different office sizes and types can also be found in Table 6. Results by site code are in Appendix A, Table 1A.

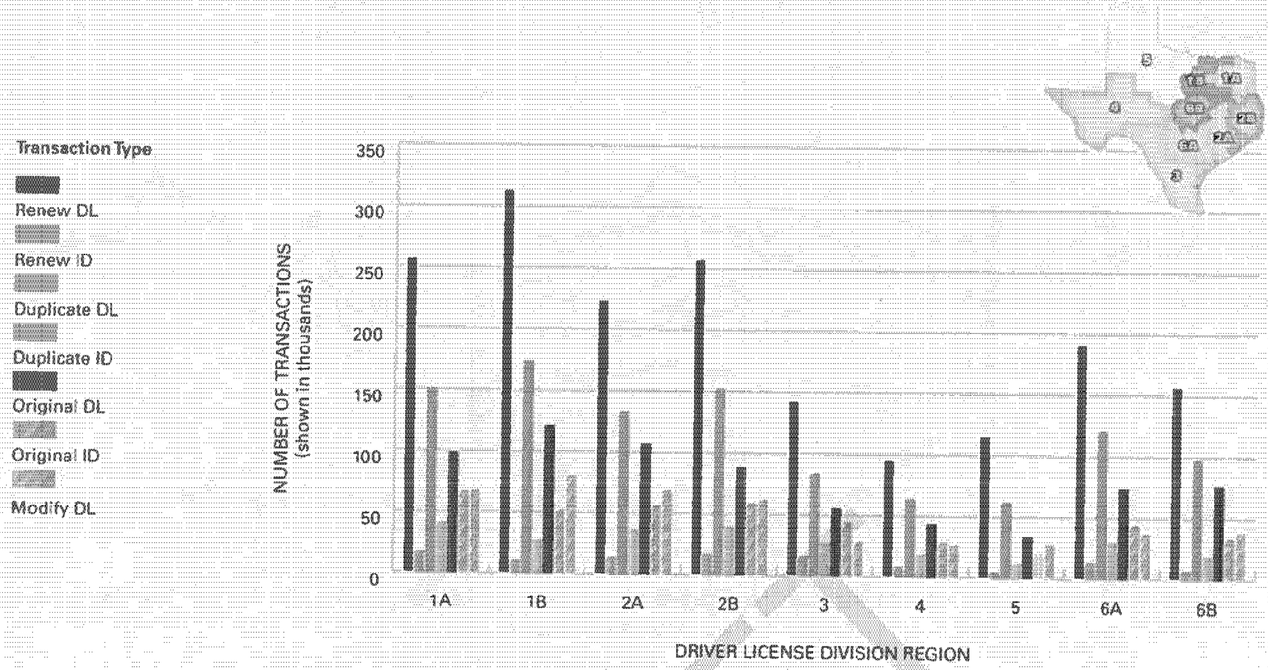


Figure 24. Transaction Type volume by region.

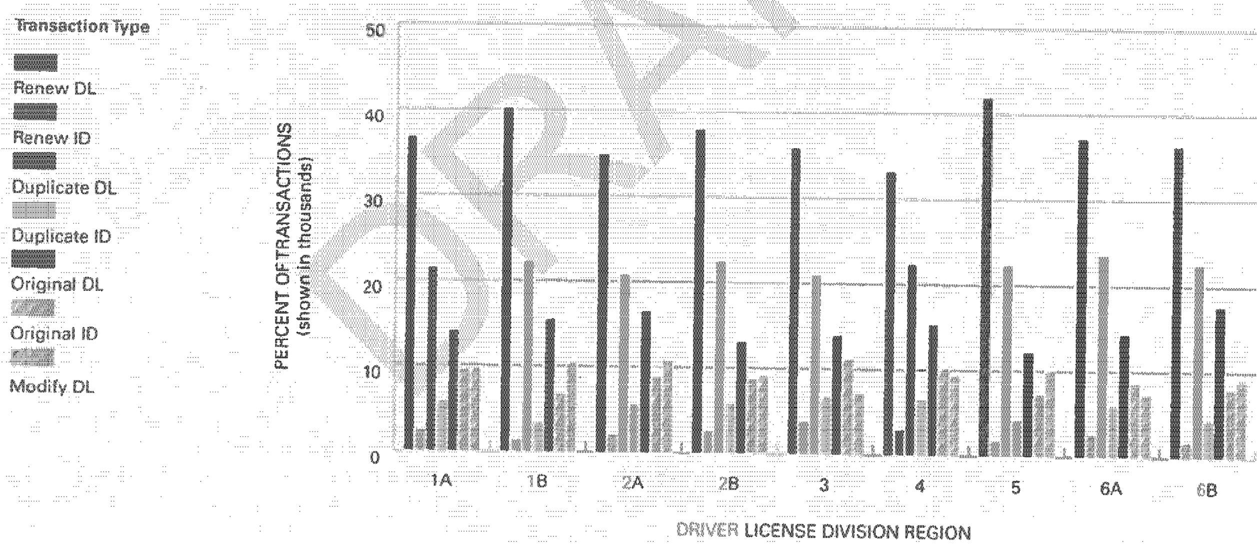


Figure 25. Transaction Type volume as a percentage of initiated transactions by region.